

NASA TECH BRIEF

Lyndon B. Johnson Space Center



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Chemical Pretreatment for the Distillation of Urine

The problem:

Systems that distill potable water from urine must deal with several problems. Biological activity in the urine results in the accumulation of micro-organisms that interfere with boiling and which migrate to the condenser and contaminate the water. Urea decomposes to form ammonia which codistills with water, and foam builds up in the boiling chamber to such a height that it fills the chamber and contaminates the condensate stream.

The solution:

A chemical pretreatment of the urine prevents micro-organism growth in the boiler and kills micro-organisms in the condenser. The chemicals also clean the evaporation surface, fix the ammonia in the boiling chamber, and suppress foaming.

How it's done:

The pretreatment solution is made up as follows:

Iodophor	0.61 gram
Sulfuric Acid	0.34 gram
Antifoam Agent	0.13 gram
Water	1.17 grams
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	2.25 grams

This amount is sufficient to pretreat 520 grams of urine.

The iodophor disinfectant contains 20 percent of available iodine, a small part of which codistills with the water and sterilizes the entire distillation unit. The iodophor is an effective cleansing agent and removes residues from the evaporator surface.

The ammonia is fixed by the sulfuric acid, which will not codistill with water. The antifoam agent is a commercially available silicone compound.

Note:

Additional information may be obtained from:

National Technical Information Service
Springfield, Virginia 22151
Single document price \$15.00
(or microfiche \$0.95)

Reference: NASA CR-128878 (N73-20142),
"Upgraded and Extended Testing of MSE Integrated Water and Waste Management Hardware".

Patent status:

NASA has decided not to apply for a patent.

Source: T. L. Hurley of
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